

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WISCONSIN

KERR CORPORATION,

Plaintiff,

Case No. 06 C 0423 C

vs.

3M COMPANY and DENTSPLY
INTERNATIONAL INC.,

Defendants

3M COMPANY AND 3M INNOVATIVE
PROPERTIES COMPANY

Counter-plaintiffs,

vs.

KERR CORPORATION,

Counter-Defendant.

DECLARATION OF DANIEL VAN DER WEIDE, PH.D

Daniel van der Weide, Ph.D, hereby declare under penalty of perjury as follows:

1. I am a Professor in the College of Engineering at the University of Wisconsin-Madison. I obtained a Ph.D in Electrical Engineering from Stanford in 1993. Attached hereto is a true and accurate copy of my curriculum vitae.

2. I have been retained by Plaintiff Kerr Corporation ("Kerr") in connection with its assertion of infringement by Defendants Dentsply International Inc. and 3M Company ("3M") of U.S. Patent Nos. 6,692,251 (the "'251 patent") and 7,066,733 (the "'733 patent"). As part of my work in regard to the '251 and '733 patents, I have studied the patents themselves, including the specifications and the claims, the patents' file histories before the United States Patent and

Trademark Office (“Patent Office”), and some of the prior art that was cited by Kerr in connection with its patent applications.

3. The ‘251 and ‘733 patents share a common title: “Apparatus and Method for Curing Materials with Light Radiation.” The relevant field of art for this patent is dental curing lights, in particular lights incorporating light emitting diodes containing semiconductor material that are able to cure composites. A person of ordinary skill in this field would typically have a bachelors degree in Electrical Engineering or Physics with coursework including semiconductor technology. Such a person would also have either an advanced degree or work experience involving the use of light emitting diodes in lighting or curing applications.

4. I have been asked how a person of ordinary skill would understand terms used in the asserted ‘251 and ‘733 patent claims.

5. I have been advised of the following legal rules that pertain to how the words of patent claims should be construed. Those rules are as follows:

- a. The claim contains an introductory clause usually ending with the language “comprising”; this clause is referred to as the “preamble.” The claim “limitations” are the requirements of the claim that defined the invention and must be present for a process or item to constitute the invention.
- b. Typically claims that use different claim language for limitations are construed to be of different scope. Dictionaries, encyclopedias, and treatises may be used to demonstrate how one skilled in the art would understand a specific term or phrase recited in a claim.
- c. The claim limitations must be understood in the context of the balance of the patent, i.e., the descriptive text and drawings of the patent, which together with the claims are referred to as the “patent specification.” The specification may alter the way in which one skilled in the art would understand a claim limitation. In addition to providing context, the specification might provide further clarification as to the meaning of a claim limitation, even providing a definition of the claim limitation. But it must be kept in mind that claims are not limited to the disclosed embodiments of the invention, and claim limitations should not be narrowly construed solely because the disclosed embodiment contains a particular feature.

d. In addition, the “prosecution history,” “file history” or “file wrapper” of the patent should be considered. The prosecution history is reflected in the Patent Office file(s) related to the issuance of the patent. Statements made by a patent applicant during prosecution of the patent application might provide further clarification as to the meaning of a claim limitation. For example, the applicant may argue that certain prior art raised by the examiner is outside the scope of a claim because it fails to disclose a certain claim limitation. In that case, the claim limitation at issue would generally be construed to exclude coverage of the disclosed element in the prior art.

e. In addition to the claim language, patent specification, and prosecution history, which are the preferred sources for claim construction, outside sources such as prior art may be referenced to construe a claim limitation.

6. The term “die” appears in certain claims in the ‘251 and ‘733 patents. Based upon my review of the claim language, the term “die” means “semiconductor junction.” Indeed, in the vast majority of claims the claim language itself defines the term “die.” For example, in claim 1 of the ‘251 patent, the claim refers to “light emitting die, the die each being a semiconductor junction” One of skill in the art reading such claim language would conclude that “die” means “semiconductor junction.” The specification of the ‘251 and ‘733 patents reinforces this meaning rather than departing from it: “The dies 30 are small bare semiconductor junctions” Col. 8, lines 9-10. I have reviewed the prosecution histories and nothing in those documents indicates any other meaning for the term “die.” At various points this meaning of “die” is reinforced by the distinctions made between the claimed die and conventional LEDs.

7. The term “semiconductor junction” is common in the art and is a reference to a junction formed by two dissimilar semiconductor materials. One such junction is a PN junction formed by p-type and n-type GaN (gallium nitride) or InGaN (indium gallium nitride), semiconductor materials used in light-emitting diodes (LEDs) that emit light of a generally blue hue. This meaning of “semiconductor junction” is well known to those of skill in the art. Nothing in the specification or prosecution histories depart from this meaning.

8. The term “mounted” appears in many of the asserted claims, often within the phrase “individually mounted” but occasionally without the “individually” modifier, as in claim 1 of the ‘733 patent. The term “mounted,” standing alone, has the common meaning, affixed to or attached to a support. In the context of the claimed inventions, to be mounted to a substrate means to be affixed to attached to a substrate in some manner. The references to dies being mounted on a substrate support this general view. ‘251 patent at col. 8, lines 6-24.

9. The term “individually mounted” has a narrower meaning than the term “mounted” alone. The term “individually mounted” is with reference to the mounting of dies on a substrate, and as an initial matter it indicates that each die is formed and exists as an individual element. In other words it indicates that the dies are mounted to a substrate without any individually associated reflectors, lenses or packaging as found in conventional LEDs. The specification supports this reading by referring to the mounting of the dies as “bare semiconductor junctions, without prepackaged individual and integral reflectors and lenses, as are found in conventional LEDs.” ‘251 patent at col. 8, lines 21-24. The prosecution history of the ‘251 patent also notes this aspect of the term “individually mounted” by noting that prior art disclosing conventional LEDs does not disclose dies that are in the form of semiconductor junctions individually mounted on substrates. 2/27/02 Amendment at 12. One of skill in the art reviewing the specification and prosecution history of the ‘251 patent would conclude that “individually mounted” means, at a minimum, that the dies are mounted as individual elements, without any individually associated reflectors, lenses or packaging.

10. During prosecution of the parent application to the ‘251 patent, further meaning was given to the term “individually mounted.” More specifically, when distinguishing over the prior art, particularly the printing arts, the applicant Kerr made it clear that the claims reciting

individually mounted dies require dies that are interconnected in a process distinct from the die fabrication process, resulting in a hybrid structure, as distinct from a purely monolithic integrated circuit. 11/30/99 Amendment at 5-7. In the integrated devices referenced by the Examiner, the dies are fabricated with the substrates and interconnected at the same time, forming a monolithic integrated circuit. Individually mounted dies forming a collective array are not so integrated, and are fabricated separately from the electrical interconnection of the dies (i.e., semiconductor junctions). One of skill in the art would conclude that Kerr relinquished coverage of the type of integrated circuits in the prior art at issue in those remarks. It is important to keep in mind that the claims, specification and the two Amendments discussed in this and the preceding paragraph do not limit the claimed inventions to a particular mounting process or technique in the sense that the dies are placed on the substrate in a particular manner and connected by a specific structure, or that they are mounted one at a time or all at once.

11. In the context of these claims reciting a plurality of dies or light emitting elements, the terms “collective array” and “collectively emitted” refer to a collection of discrete elements connected so that they are powered simultaneously, in a plenary fashion. This meaning is consistent with the specification as well as the prosecution history, where the collective aspect of the array and emission of light from the dies was a basis to distinguish the claimed inventions from prior art involving emission in a non-collective fashion. 11/30/99 Amendment at 5-7.

12. Several asserted dependent claims refer to die that emit light “in the range of 0-180°.” This makes sense, because dies that are semiconductor junctions will generally emit light in all directions unless impeded in some manner. Accordingly, when the claims refer to “in the range of 0-180°” one of skill in the art would interpret the phrase as meaning at least through the

entire range of 0-180°. Prior-art LEDs having individual reflectors would not be understood by one of ordinary skill to emit light through this range.

13. All of the asserted claims require an “optically reflective element.” This claim term has basic ordinary meaning that was further clarified during prosecution of the patents at issue. An optically reflective element is a metallic surface or a surface coated with a reflective material such as a metallic or dielectric film from which substantially all the light is reflected regardless of the angle of incidence of the light. This is the common meaning for reflective surfaces in general. This differs from internal reflections for which the angle of incidence strongly determines whether a ray of light is reflected or not. For example, fiber optics and lenses, which exhibit some reflective characteristics, would not be reflective elements as used in the claims. Thus, “optically reflective element” in the context of the asserted claims does not mean any structure that is reflective in any possible way. This meaning is reinforced by the specification, which points to the “reflective surface or reflector 42” as the optically reflective element referred to in the claims. Col. 9, line 36. In addition, the specification describes other arguably reflective surfaces, such as fiber optics, non-imaging lenses and totally internally reflective lenses as distinct from the optically reflective element. Also, during prosecution of the ‘251 patent the applicant made clear that the term did not include any surface that reflects in any manner by distinguishing the claimed “optically reflective element” from prior art fiber optics and lenses positioned near the die array. 2/27/02 Amendment at 12-15. One of skill in the art reading the specification and prosecution history would view those structures as excluded from the scope of optically reflective element by implication.

14. All of the claims require a certain position for the claimed optically reflective element. Many of the claims require that an optically reflective element be “coupled to surround

an outer edge of the array of light emitting die.” In the context of the claims, this indicates to one of skill in the art that the reflective element is positioned around the array such that the element’s reflective surface redirects light from the outer edge of the substrate and from the die array. Other claims employ slightly different language such as “coupled to surround the plurality of light-emitting elements” or “coupled to surround the light-emitting element and protective layer.” As with the first phrase discussed above, the meaning is readily understood from the claim language itself and refers to a reflective surface positioned around the light emitting elements such that the reflective element’s surface redirects light from the light emitting elements. With respect to the last phrase, the meaning is positioned around the light emitting element and layer such that the reflective element’s surface redirects light from the light emitting element and protective layer. The specification and prosecution history do not depart from these straightforward interpretations, and depict an embodiment where the reflector is attached to the outer edge of the substrate and surrounds that edge and the array of die, which is one way to meet the requirements of these phrases in the claim. See, for example, Figure 2 of the ‘251 patent. It is important to note that the claims are not limited to this example in the specification, as a reflective surface can be coupled to surround an object without be coupled to that object.

15. I hold the foregoing opinions to a reasonable degree of scientific certainty.

I declare the foregoing to be true and correct to the best of my knowledge subject to the penalties of perjury.

Date: March 5, 2007

/s/ Daniel van der Weide

Daniel van der Weide, Ph.D